NOVEMBER/DECEMBER 2024

CCA53/CCS53/FCA53/FCS53 — DESIGN AND ANALYSIS OF ALGORITHMS

Time : Three hours Maximum : 75 marks

Shanmuga Industries Arts & Science College
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SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is a stack?
2. Define algorithm.
3. What is meant by optimality?
4. Mention any two applications of divide and conquer method.
5. What do you mean by spanning tree?
6. What is tree vertex splitting?
7. State the properties of a binary tree.
8. What do you mean by Breadth First Search (BFS)?
9. Define graph coloring.
10. What is Hamiltonian path?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) List out the basic operations that can be performed on a stack with example.

Or

(b) Give an account on space complexity.

12. (a) Derive the time complexity of merge sort and explain.

Or

(b) Write down the algorithm for quick sort.

13. (a) Explain Prim's algorithm with example.

Or

(b) Explain the Kruskal's algorithm for solving the job sequencing problem.

14. (a) Elucidate the 0/1 Knapsack problem.

Or

(b) Differentiate BFS and DFS.

15. (a) What is FIFO Branch and bound in detail?

Or

(b) Describe about the Hamiltonian cycles with an example.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the operations in Queue's with example.

17. Enumerate Stassen's matrix multiplications.

18. Describe optimal randomized algorithm in detail.

19. Explain the algorithm for forward and backward multistage graphs.

20. Expound 8-queens problem with an example.

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